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CLIWOC MULTILINGUAL METEOROLOGICAL DICTIONARY

An English-Spanish-Dutch-French dictionary of wind force terms used by mariners from 1750 to 1850

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Roberto Gustavo Herrera

During the course of the preparation of this dictionary, one of the contributors, Roberto Gustavo Herrera, passed away. This completed work is dedicated to his memory.

A la memoria del Roberto Gustavo Herrera, que contribuyó con su entusiasmo y buenhacer a este diccionario. ¡Que tengas buena travesía, marinero!

Many people have contributed towards the preparation of this volume.

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INTRODUCTION

This dictionary is the first attempt to express the wealth of archaic logbook wind force terms in a form that is comprehensible to the modern-day reader. Oliver and Kington (1970) and Lamb (1982) have drawn attention to the importance of logbooks in climatic studies, and Lamb (1991) offered a conversion scale for early eighteenth century English wind force terms, but no studies have thus far pursued the matter to any greater depth. This text attempts to make good this deficiency, and is derived from the research undertaken by the CLIWOC project[1] in which British, Dutch, French and Spanish naval and merchant logbooks from the period 1750 to 1850 were used to derive a global database of climatic information. At an early stage in the project it was apparent that many of the logbook weather terms, whilst conforming to a conventional vocabulary, possessed meanings that were unclear to twenty-first century readers or had changed over time. This was particularly the case for the important element of wind force; but no special plea is entered for the evolution in nautical vocabulary, which often reflected more wide-ranging changes in the respective native languages.

The key objective was to translate the archaic vocabulary of the late eighteenth and early nineteenth century mariner into expressions directly comparable with the Beaufort Scale (see Appendix I). Only then could the project's scientific programme be embarked upon. This dictionary is the result of the largest undertaking into logbook studies that has yet been carried out. Several thousand logbooks from British, Dutch, French and Spanish archives were examined, and the exercise offered a unique opportunity to explore the vocabulary of the one hundred year period beginning in 1750. The logbooks from which the raw data have been abstracted range widely across the North and South Atlantic and the Indian Oceans. Only the Pacific, largely in consequence of the paucity of regular naval activity in that area, is not well represented. The range of climates encountered in this otherwise wide geographic domain gives ample opportunity for the full range of the mariner's

nautical weather vocabulary to be assessed, from the calms of the Equatorial regions, through the gales of the mid-latitude systems to the fearsome storms of the tropical latitudes. The Trade Winds belts, the Doldrums, the unsettled mid-latitudes, even the icy wastes of the high latitudes, are all embraced in this study. It is not here intended to pass any judgements on the climatological record of the logbooks, and this text seeks only to provide a means of understanding archaic wind force terms and, other than to indicate those items that were not commonly used, no information is given on the frequency with which different terms appeared in the logbooks. Attention is, furthermore, confined to Dutch, English, French and Spanish because these once great imperial powers were the only nations able to support wide-ranging ocean-going fleets with their attendant collections of logbooks and documents over this long period of time. The work is offered to the wider academic community in the hope that they will prove to be of as much value as it has been to the CLIWOC team.

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THE BEAUFORT WIND FORCE AND WEATHER SCALES

The period in question (1750 to 1850) was a vital one in the evolution not only of English but, arguably, of nautical vocabularies generally. It was in 1806 that Francis Beaufort first formulated his wind and weather scale (Courtney, 2002). It is to this wind force scale, or to be more precise, its more recent derivatives, that the many and various logbook descriptors are equated

[1] For more information on this project consult the website at http://www.ucm.es/info/cliwoc/

in this dictionary. Although used only in his personal logbooks in the first instance, Beaufort's later influence as hydographer to the Royal Navy led to its formal adoption by the Service in 1838. His first two schemes can be found in Appendix I, but these original proposals have undergone several minor changes over the past century and half, particularly in respect of the names allocated to some of the wind forces. These changes are not discussed here in detail, and the dictionary's attention focuses on the more immutable thirteen numbers used to distinguish the scale. Beaufort's scale was proposed in the age of sail, and the forces from 5 onwards were defined in terms of the type and quantity of sail that could be safely carried in a "well-conditioned man of war". Only in 1906 did George Simpson redefine the scale in terms of the state of the sea that accompanies the different wind forces (Appendix I). The International Meteorological Organisation adopted the Beaufort wind and weather scales in 1939, over 100 years after its first proposal. At the same time, wind speed ranges were included in the scale to define the upper and lower limits of each force. Discussions of the Beaufort Scale, its origin, character and development can be found in Fry (1967), Kinsman (1969) and Crutcher (1975).

AN INTRODUCTION TO NAVAL LOGBOOKS

The dictionary focuses on those terms found in naval logbooks. It is only in such documents that weather terms were used in a regular and broadly consistent fashion. In that important sense they differ from many contemporary landsmen's diaries and letters, in which descriptions of the weather followed few conventions in respect of vocabulary. Only the five-point scheme proposed by the *Societas Meteorologica Palatina* (Kington, 1988) in the late eighteenth century sustains comparison with the wind force scales used by mariners.

The majority of logbooks that have survived from the study period are derived from either the state naval services of Britain, France, Spain and the Netherlands, or from the quasi-colonial joint stock undertakings of the English

East India Company (EEIC) or the Dutch East India Company (VOC – Verenigde Oostindische Compagnie), the West India Company (WIC: Westindische Compagnie) and the Middelburg's Commercial Company (MCC: Middelburgsche Commercie Compagnie).. Each of these sources had a strong and often distinctive tradition of training officers who were responsible for keeping the logbooks. The EEIC enjoyed the services of its own hydrographer, one of whom - Alexander Dalrymple - exercised a profound influence on Francis Beaufort. But long before Beaufort devised his wind force scale in 1806 most officers, and those of the British services in particular, used nationally-based unofficial, but widely-adopted scales when describing wind force. There were of course no anemometers at this time, and estimates were based on experience and judgement.

Logbooks were not, however, weather diaries. They served two, more important, functions. On the one hand they were the officer's official account of the management of his vessel, and could be called upon as legal documents in the event of a court martial or enquiry; a function that they continue to carry out today. On the other hand they were also navigational documents in which the ship's progress was carefully noted and her location estimated. For much of the study period, the most important navigational challenge was the determination of longitude. Although the Harrison chronometer and the method of 'lunar distances' had been fully developed by the close of the eighteenth century, many ships' officers continued to employ the system of 'dead (or deduced) reckoning' when estimating longitude (Hewson, 1983). This reluctance to adopt the new and more reliable methods was a consequence of the cost of a chronometer, and the numerical demands of the method of lunar distances. Dead reckoning, however, was not without its arithmetic challenges, and is described in texts such as Robertson (1786) and, Norie (1889). It is this latter respect that weather observations were so assiduously collected. Wind force and wind direction were needed to provide a measure of the degree to which the vessel's course was offset from its compass bearing; a feature known as 'leeway'. Without these estimates, projected and plotted course could be wildly inaccurate.

Whilst the layout of the logbooks inevitably differed from country to country, the weather information that was collected was confined to the same three categories of wind force, wind direction and weather. Wind force and wind direction were the most important from the point of view of navigation, but notes were also made on the general state of the weather. Thus, entries would appear making reference to rain, snow, fog, thunder, hail or lightning. The sighting of icebergs often excited attention and were usually recorded. For the most part, the terms that were used when describing such events are those that are in common use today. They need no translation, and even the occasional archaic term is usually without ambiguity. For this reason, much of what follows concentrates on the more vexed issue of wind force terms.

Logbooks also contained references to the state of the sea. In the case of Dutch, English and French logbooks such entries were relatively infrequent, and did not conform to any recognisable scale. Spanish officers, on the other hand, paid closer attention to the state of the sea using what appears to have been a standardised set of descriptors. For this reason, a section on sea state terms has also been included.

For the purposes of ease of use, the dictionary is presented in four major sections, each of which represents one of the four languages of the original documents, and each of which is introduced by a general account of the background to the original work as each nationally-based data set provided its own suite of problems and challenges. A concluding summary section provides a multi-lingual overview.

THE DERIVATION OF THE EQUIVALENCE SCALES

The following sections were derived using a variety of methods. Most importantly, a number of contemporary documents and nautical texts exist that shed light on the meanings to be attached to some of the terms. More specific reference is made to these in the introductions to the language-based sections.

Other logbook entries were also of use in respect of defining archaic terms. One of the most valuable of these was the inclusion of the distances covered each day by the vessels (this measure was used with particular, almost daily, frequency in English logbooks). Because there is a well-known relationship between ship speed under sail and wind velocity, which is quasi-linear up to Beaufort force 7 (Harland and Myers, 1984), this allowed the relative strengths of winds described by different terms to be assessed. References to the amount of sail that could safely be carried also clarified the issue, and Beaufort was later to use this criterion to define a number of his wind force terms (Kinsman, 1969). Wheeler's (1995) analysis of an illustrated series of logbooks kept by the eighteenth century mariner Nicholas Pocock was also useful in confirming the definitions of some terms.

Although assistance in interpretation came from several sources, there remained a residual group of terms that defied unambiguous definition. Fortunately such terms were infrequently used, representing less than 2 per cent of the sample of logbook entries that were used in the preparation of this dictionary. These words or descriptions were idiosyncrasies of expression employed occasionally by a few officers, but never consistently. They have, for the purposes of completion, been included within the dictionary but without the benefit of any Beaufort Force equivalent, and in the hope that future editions or later work may provide a resolution to this issue. Also included are those descriptions of wind which, though popular, have no meaning in Beaufort Scale terms ('variable', 'squally' etc.). In order to maintain a measure of consistency with the character of the Beaufort Scale, and not to lengthen the text unnecessarily, the terms listed in the following sections include only the principal adjectival qualifiers ('moderate', 'fresh', 'strong' etc.). Secondary adjectival qualifiers such as 'very', 'slightly' or 'less' (and their equivalents in the French, Dutch and Spanish) have been excluded. Neither is any attempt is made to interpret the vast range of terms peculiar to the management of ships in the age of sail, and the interested reader is referred to the dictionaries listed at the conclusion of this document. Attention is otherwise confined to those terms that relate directly to the description of wind.

The complexities of interpretation that prevailed in respect of wind force terms were not, however, repeated in descriptions of the weather. These, for the most part, consist of expressions, the meanings of which have not changed over the centuries (rain, snow, hail, fog etc.) in any of the languages and, for this reason, they are not included in this dictionary.

KEY TO DICTIONARY ABBREVIATIONS

BF: Beaufort Force

EEIC: English East India Company

IU: infrequently used

NDA: no definition available. This may be because the term refers to wind direction, .e.g. 'fair wind', rather than force, or because of uncertainty or imprecision regarding its point on the Beaufort wind force scale, e.g. 'baffling winds'. Descriptions such as 'variable winds' etc. fall into this same category.

OBT: original Beaufort term, i.e. used in his modified scale proposed in 1807 (English dictionary only)

OED: Oxford English Dictionary

RN: English Royal Navy

VOC: Dutch East India Company (Verenigde Oostindische Compagnie)

In the four language sections that follow, each logbook term is followed by the equivalent Beaufort Force number or NDA. For example, **brisk gale:** BF 6

INTRODUCTION TO ENGLISH TERMS

One of the characteristics of English nautical weather terms is the perceptible evolution of the vocabulary over the study period. In many cases therefore an attempt has been made to indicate not only the Beaufort equivalent force of the term but also to note its origin. The emergence of the Beaufort Scale at this time has been noted above, and the evolving vocabulary that characterises the period can be seen most readily in the gradual adoption before 1790 of the term 'breeze' in its various forms of 'light', 'moderate' etc. The term had been part of the English language since the early seventeenth century, but had been used in only a limited fashion to describe those coastal circulations that are today known as land and sea

breezes. Before 1750 most winds other than ‘calms’ and ‘light airs’ had been described as some form of ‘gale’ varying between the ‘strong’ and ‘hard’ down to the ‘small’, ‘soft’ and ‘feint’. The latter terms are included in this dictionary, but had passed out of use by 1750 for all but the most conservative and long serving of officers. It was these lesser ‘gales’ that were replaced in the vocabulary by the various forms of ‘breeze’, light, fresh etc. as appropriate. A full account of late seventeenth wind force terms can be found in Suárez Dominguez (2002).

Specific guidance in understanding archaic English terms was found in contemporary publications. Most important of these is William Falconer’s *Universal Dictionary of the Marine,* which ran to several editions in the late eighteenth and early nineteenth century (Falconer, 1780). The *Oxford English Dictionary* (1933) provided historical information on many of the terms. Further guidance was offered by *Horsborough’s Sailing Directions* (Horsborough, 1817), the introduction of which is of particular interest.

Whilst the vocabulary changed, becoming generally wider after 1750, there is no evidence to suggest that the meanings of the various terms underwent any significant change, and the dictionary is reliable for the one hundred years beginning 1750 (see Appendix I). It must, however, be noted that a distinction existed between the vocabularies of the officers of the Royal Navy and those of the EEIC. Close examination of many hundred logbooks from both sources confirms that the former used a relatively narrow range of terms that in the years immediately before 1800 closely resembled the Beaufort terms. Beaufort had himself been a naval officer with experience in both services (Courtney, 2002). On the other hand, the EEIC logbooks indicate a much more complex system in which winds were classified not only by strength but also by origin. Thus, for example, distinction is made between ‘breezes’, ‘trades’, ‘monsoons’ and ‘gales’. This attention to detail reflects the influence of the Company’s first hydrographer – Alexander Dalrymple – and has given rise to a particularly rich vocabulary sub-type.

The following section is based on over 15,000 logbook entries for wind force. Those that are described as IU (infrequently used) represent, in total, less than 0.5 per cent of those entries. There will, nevertheless, be a number

of residual, non-standard descriptions in logbooks not included in this survey. Fortunately it is probable that they represent little more than the idiosyncratic or fanciful employment of terms by individuals, and they enjoyed no wide currency in the officer classes. Plural terms are taken to be synonymous with their singular forms. For example, ‘light air’ is defined together with ‘light airs’, ‘strong gale’ with ‘strong gales’ etc.

DICTIONARY OF ENGLISH TERMS

baffling airs/light winds/winds: IU, NDA, refers to winds of changeable direction

blows fresh (incl. blowing and blew fresh): IU, but popular before 1700. BF 6

blows hard (incl. blowing and blew hard): IU, but popular before 1700. BF 10

blows strong (incl. blowing and blew strong): IU, but popular before 1700. BF 9

breeze: IU, generic term rarely used without an adjectival qualifier. Derived from Castilian *briza* or north-east wind, introduced into English in C16 (OED). Widespread as a wind force term only after 1750.

brisk gale: BF 6

brisk trade: BF 5

calm (incl. dead calm and flat calm): BF 0

constant breeze/gale/trade/wind: IU, NDA without further qualification such as ‘strong’, ‘fresh’

easy breeze: IU, BF 2

easy gale: IU, but popular before 1700. BF 3

faint breeze, gale: see feint

fair winds: IU, NDA. Refers to direction in relation to the vessel’s motion, and is a following wind. It makes no presumption of force.

feint breeze: BF 2

feint gale: BF 3

fine breeze: BF 5

fine gale: BF 5

fine trade: BF 5

fresh breeze: BF 5, OBT

fresh gale: BF 8

fresh monsoons: IU, NDA

fresh trade: BF 6

fresh wind: BF 6

gale: IU, an ancient generic term, rarely used without an adjectival qualifier. Of probable Scandinavian origin (OED). Used before 1770 to describe winds of a very wide range of strengths, including those covered today by various 'breezes' of the Beaufort Scale (see Appendix I).

gentle breeze: BF 3, OBT

gentle gale: BF 3

gentle trade: BF 3

great gales: IU, OBT

hard gale: BF 10

heavy gales: IU, BF 9

hurricane: BF 12, OBT. Introduced into English in the C16 by contact with Spanish navigators who, in turn, adopted the term from the indigenous Carib (West Indian) expression *furacan*.

inclinable to calms: BF 1, almost always used with 'light airs, i.e. 'light airs, inclinable to calm'.

increasing breezes/gales/trade/wind: IU, NDA. The term suggests wind rising from a lower to a higher force.

light airs: BF 1, OBT.

light breeze: BF 2, OBT.

light gale: IU, BF 3. Commonplace before 1700, but rare after 1750.

light monsoons: IU, BF 4

light trade: BF 4

light winds: BF 2

little winds: BF 2

moderate: BF 4. Used abundantly until 1838. Francis Beaufort railed against its seeming ambiguity, but employed it frequently until 1806.

moderate breeze: BF 4, OBT

moderate gale: BF 7, OBT

moderate monsoons: IU, BF 5

moderate trade: BF 5

monsoon: IU, generic term rarely used without an adjectival qualifier. Employed widely by EEIC officers, but rarely by those of the RN. To be found only on those occasions when the vessel was in the Indian Ocean or South China Sea. Derived, through Dutch contacts, from the Arabic *mausim*. Not used in English before C17.

pleasant breeze: BF 4

pleasant gale: BF 5

pleasant monsoon: IU, NDA

pleasant trade: BF 5

pleasant wind: BF 4

small airs: BF 1

small gale: IU but popular before 1750, BF 4

squalls (incl. squally and all derivatives): NDA, squalls appear in association with winds of all forces from 1 upwards, and have no correspondence on the Beaufort Scale. Dalrymple (1789) offers this same interpretation.

steady breeze: BF 5

steady gale: BF 6

steady trade: BF 6

stiff breeze: BF 6, OBT, but changed to strong breeze in the 1838 Beaufort scale

storm (incl. stormy): BF 11, OBT. Also used widely in non-scientific writing. Derived from Old High Gothic *sturm*.

strong breeze: see also stiff breeze, BF 6

strong gale: BF 9, OBT

strong gusts: IU, OBT

strong monsoon: IU, BF 7

strong trade: BF 7

strong wind: BF 8

top-gallant gale: IU, BF 5

tempest: BF 11. Also used widely in non-scientific writings. From the Latin *tempestas*.

trades: IU, generic term rarely used without an adjectival qualifier. Employed widely by EEIC officers, but rarely by those of the RN. To be found only on those occasions when the vessel was in the Trade Winds belts immediately north and south of the Equator. Derived from the expression 'blows trade', which is a wind that blows steadily (it has nothing to do with the business of trade). In the C16 and C17 it was used to describe any such persistent wind, but by 1750 it had assumed (as the logbook evidence confirms) its present-day meaning.

tremendous gales: IU, BF 11

typhoon: IU, BF 12, this term is of uncertain origin. It is often suggested to derive from the Chinese term 'tai fung' (great wind), but may also derived from the Arabic 'tufan', or even the Greek 'tuphon' (whirlwind).

unsettled wind: NDA. The nature of such winds forbids conversion to the Beaufort Scale, see also **variable**.

variable: IU, NDA. Its very nature, and that of its compound uses, denies definition in Beaufort force terms.

violent gales: IU, BF 9

violent storm: IU, BF 11

whole gale: BF 10, OBT

INTRODUCTION TO SPANISH TERMS

One of the greatest difficulties in working with wind and weather terms from Spanish sources is the lack of codes or conventions to govern the use of the many descriptors. The first significant contribution in this field came as late as 1831 from O'Scanlan, whose Maritime Dictionary lamented the absence of any generally agreed scheme until that date. Yet Spanish navigators had been amongst the first to set forth on the high seas in search of trade and empire. A Royal Order issued in 1575 required ships' officers employed in the service of the *Carrera de Indias* (the route from Spain to her American

colonies) to keep a record of each trans-Atlantic journey, paying particular attention to winds, currents and hurricanes. Consequently wind force terms are recorded as far back as this formative period. Prieto and Herrerra (1999) have examined the climatological evidence in some of these records. Whilst every effort was made to gather and record information in the Spanish documents, little attention was given to the question of standardisation of expression or vocabulary. From the mid-eighteenth century a change does begin to take place, and Spanish officers begin to adopt terms not unlike those being used by English mariners at the time. At the close of the century the famous scientist Antonio de Ulloa (1795) published an item in which wind forces were defined with a hitherto unknown degree of rigour, using a system that carries a striking similarity to that being used in England at the same timer. The scheme seems not, however, to have enjoyed the wide popularity of its British counterpart. Such conservatism notwithstanding, by the mid nineteenth century the direct equivalent of the Beaufort Scale had official recognition and appeared in texts such the Spanish translation of Bechet (1863), prepared by M. Lobo, which includes a Spanish version of the wind scale.

Logbooks of Spanish vessels in the service of the government postal system can be found in the Archivo General de Indias (Seville). They cover only the latter half of the eighteenth century, but are homogenous with respect to their routes (one to La Havana, the other to Montevideo), to their officer crews (all of whom were similarly trained) and to the type of vessel that was used. It seems probable that their vocabulary was common to Spanish mariners of the age.

Over 800 wind descriptors were identified at the first stage of the analysis. However, the judicious grouping of terms, for example by standardising spellings and avoidance of multiple adjectival qualifiers, reduced the final count to just 104; a figure only marginally greater than that from the English sources. Of these, the five most frequent account for over 75 per cent of all entries. In common with English logbooks, this suggests that the vocabulary was common to, and understood by, the majority of Spanish

officers despite their tendency often to describe the wind and weather in terms that were frequently lyrical rather than objectively scientific.

The analysis of the equivalence of Spanish terms to the Beaufort scale revealed that a number of items, whilst clearly referring to strong and intense winds, could not confidently be ascribed to a specific point on Beaufort's scale. Such ambiguous items are denoted in the dictionary by BF>8.

DICTIONARY OF SPANISH TERMS

abonanzado: IU, BF 4
abonanzando: IU, BF 4
abonanzo: IU, BF 4
abrisado: IU, BF 2
afugado: IU, NDA.
ahuracanado: IU, BF 12
alterados: IU, BF > 8
altivo: IU, BF 7
amenazante: IU, BF > 8
apacible: BF 4
apaciguado: IU, BF 4
arreciando: IU, NDA
arrecio: IU, NDA
aturbonado: IU, BF > 8
aventolinado: IU, BF 1
benigno: IU, BF 4
blandura: IU, BF 1
bonancible: BF 4, OBT
bonanza: BF 4
borrascoso: IU, BF > 8
brisa: BF 2
brisado: IU, BF 2
calma: BF 0, OBT
calma muerta: BF 0

calmo: BF 0

calmoso: BF 2

constante: NDA

contrario: NDA

contrastado: NDA

de 6 y 7 millas: IU, BF 2

de 8 y 9 millas: IU, BF 3

de alta vela: BF 6

de proa: IU, NDA

de toda vela: BF 6

de toda vela larga: IU, BF 6

debil: IU, BF 0

demasiado: IU, BF > 8

desigual: IU, NDA

durito: BF 6

duro: BF 7

en aumento: IU, NDA

en fugas: IU, NDA

endeble: IU, BF 3

escaso: BF 2

ferocidad extraordinaria: IU, BF 12

firme: IU, NDA

flojito: BF 2, OBT

flojo: BF 3, OBT

fortisimo: IU, BF 11

frescachon: BF 7, OBT

frescachonazo: IU, BF 7

fresco: BF 6, OBT

frescote: IU, BF 6

fresquecito: BF 5

fresquito: BF 5, OBT

fuerte: BF 7

fuertecito: BF 6

fuerza: IU, BF > 8

fugadas: NDA

fugadas huracanadas: IU, BF 12

fugoso: NDA

furia: IU, BF > 8

furioso: BF > 8

huracan: BF 12

huracanado: BF 12

impetuoso: IU, BF > 8

inaguantable: IU, BF > 8

incostante: IU, NDA

insoportable: IU, BF > 8

insufrible: IU, BF > 8

intenso: BF 7

intolerable: BF > 8

moderado: BF 4

muchisimo: IU, BF 8

mucho: BF 7

no ha habido: IU, BF 0

pacifico: BF 0

pardo: IU, BF 2

poco: BF 2

rafagas: NDA

recalmones: IU, NDA

recio: BF 7

regular: NDA

regularcito: IU, NDA

rieguroso: IU, BF > 8

sereno: IU, BF 0

sosegado: IU, BF 0

suave: BF 2

tempestad: IU, BF > 8

tempestuoso: BF > 8

temporal: BF 8, OBT

tormenta: IU, BF 9

tormentoso: BF 9

tormentoso como especie de huracan: IU, BF 12

turbonada: BF > 8

vacilante: IU, BF 2

variable: NDA

variando: IU, NDA

variedad: IU, NDA

ventolinas: BF 1, OBT

ventoso: NDA

vivito: IU, BF 6

vivo: IU, BF 7

INTRODUCTION TO DUTCH TERMS

The most notable feature of the Dutch wind force vocabulary is the remarkable degree to which the terms were based on the maximum amount of sail that a vessel could carry under the prevailing conditions. Indeed, nearly 50 per cent of the expressions make direct reference to specific sails (in English there is only one such expression – topsail gale). Because of the increased stresses on the ship's sails, masts and rigging occasioned by stronger winds, the number and area of sails had to be reduced as wind speeds became greater. If the sails were so removed, the process started with the uppermost and smallest, then progressing to lower and larger sails. Around 1750 sail technology had already improved so far that sails did not need to be taken in completely, but could, by the process of 'reefing'[2], be progressively reduced in area. This technique was refined in the subsequent years, and at the close of the study period in 1850 mainsails could carry as many as four rows of reefs. At the time, sails were described as single, double, triple or close reefed depending upon how many of the rows of reefs

[2] a reef is a line of long canvas tags stitched to the sail that allowed part of it to be hauled in, but leaving all that below the reef exposed to receive the wind.

were taken up. Close reefing would reduce the sail area by most. Further information on reefing and sail management can be found in Harland and Myers (1984).

Until the end of the eighteenth century most of the ocean-going vessels were square-rigged sailing ships, which means that they were equipped with three sails standing above each other. The highest sail was called the “bramzeil” (topgallant sail in English), the middle was the “marszeil” (topsail) and the lower one the “onderzeil” (course or mainsail). Around the turn of the century a sail above the “bramzeil” was added that was called the “bovenbramzeil” (royal sail), leaving the other “bramzeil” as the “onderbramzeil” (topgallant). Later also the “marszeil” was split in the same fashion to give the “bovenmarszeil” and the “ondermarszeil” (upper and lower topsails). The terminology of the wind forces progressed parallel to these developments. Appendix IV provides a complete list of all sail names for ships of this period.

Since the Dutch wind force terminology is so closely linked to the sailing practice, it provides an explicit means of determining the order of the many Dutch wind force terms. This allows for refinements in the Dutch translations to the Beaufort Scale that are not possible in the other languages.

In the Dutch dictionary that follows some individual adverbs and adjectives are also included. This is because they appear very often in the descriptive terminology of the wind forces. As no wind force definition can be applied to them and they were not intended to be used for this purpose, they are distinguished by use of italic script. The frequently used descriptions of the degrees of reefing are similarly identified.

DICTIONARY OF DUTCH TERMS

***afwisselend*:** IU, varying

al de zeilen bij: IU, BF 1, all sails in use

blackstill, bladstil: see **stil**

bovenbramzeilskoelte: BF 2, royal sail breeze (see also later qualified uses of this term)

bovenmarszeilskoelte: BF 5, upper topsail breeze (see also later qualified uses of this term)
bramzeilskoelte: BF 3, topgallant sail breeze (see also later qualified uses of this term)
briesie, briesje: BF 1
buiig, buijig: IU, squally
coeltie, coeltje: see **koelte**
***dicht* (incl. *digt, driedubbel* or *3 gereefde*):** NDA, not a wind force term, but indicates that three reefs on a sail have been taken in, see following items
dicht gereefde marszeilskoelte: BF 9, close reefed topsails
dicht gereefde onderzeilskoelte: IU, BF 10, close reefed mainsails
dood stil, doodstil, doodstilletjes, doodstilte: see **stil**
***doorgaand, doorstaand*:** NDA, constant
***doorkomend*:** NDA, starting, increasing
***dubbel* (incl. *dubbel, dubbeld* or *2 gereefde*):** NDA, not itself a wind force term, but indicates that two reefs on a sail have been taken in (double reefing), see following items
dubbelgereefde bramzeilskoelte: IU, BF 5, double reefed topgallants
dubbelgereefde marszeilskoelte: BF 6, double reefed topsails
***enkelgereefde, gereefde*:** NDA, not itself a wind force term,
but indicates that one reef on a sail has been taken in (single reefing)
enkelgereefde (marszeils)koelte: see **gereefde marszeilskoelte**
***frische* (incl*. frissche, frisse, frissen*):** NDA, fresh
frisse koelte: BF 1
flaauw (incl. flauw, flauwtjes, flouw): BF 1, light, weak
flauwe bovenbramzeilskoelte: IU, BF 2
flauwe bramzeilskoelte: BF 3
flaauwe koelte, flauwe koelte: BF 1
frisse marszeilskoelte: BF 4
***gemeene, gemene*:** NDA, normal or commonplace, see following items
gemene bramzeilskoelte: BF 3
gemene frisse bramzeilskoelte: IU, BF 2
gemene koelte: BF 2

gemene marszeilskoelte: IU, BF 4

gereefde marszeilskoelte: BF 5, single reefed topsails

gereefde onderzeilskoelte: BF 9, single reefed coarses

***gestadig*:** steady

gestadige bovenbramzeilskoelte: IU, BF 2

gestadige bramzeilskoelte: IU, BF 3

gestadige koelte: IU, BF 5

harde wind: IU, BF 7

kleine koelte: IU, BF 1

koelte (incl. koelten, koeltie, koeltje, koeltjes): BF 2, but also used as a general qualifier for other terms where it carries the meaning 'breeze'.

labber (incl. labbere koelte, labberkoelte): BF 2

labber bramzeilskoelte: BF 2

leizeilskoelte, lijzeilskoelte: IU, BF 2, studding sail breeze

lichte bovenbramzeilskoelte: BF 2

lichte bramzeilskoelte: IU, BF 3

lichte koelte: BF 1

luchtje (incl. lugie, lugje, lugtje): see **koelte**

marszeilskoelte: BF 4, topsail breeze

onderzeilskoelte: BF 8

***onegale, ongestadig*:** NDA, unsteady. Usually used as an adjectival qualifier

ongelijke bramzeilskoelte: IU, BF 3

ongestadige bramzeilskoelte: BF 3

ongestadige flauwe koelte: IU, BF 1

ongestadige gereefde marszeilskoelte: BF 5

ongestadige koelte: BF 2

ongestadige marszeilskoelte: BF 4

orcaan, orcaen, orkaan: IU, BF 12. Literally, a hurricane and again derived from the same Carib linguistic source as the English term.

passaat, passaatkoelte, passaatwind: IU, BF 4, Trade Wind. Unlike the English equivalent term this was rarely used, and confined to lighter winds.

rondlopende (or rondgaande) koelte: IU, BF 1, variable breeze

slappe bramzeilskoelte: BF 2

slappe koelte: BF 1
stijve bramzeilskoelte: BF 4
stijve gereefde marszeilskoelte: BF 6
stijve koelte: BF 6
stijve marszeilskoelte: BF 5
stil (incl. still, stille, stilleties, stilletjes, stilte, stiltetjes, stilties): BF 0
storm: IU, BF 10
swaere storm, zware storm: IU, BF 10
topzeilskoelte: IU, BF 4, topsail breeze
variable, variabele: BF 1
variabele koelte: IU, BF 1
zeer zware storm: IU, BF 11
zuchje (incl. zuchtje, zuggie, zugje): see **koelte**

INTRODUCTION TO FRENCH TERMS

A sample of 99 logbooks from the Archives Nationales, Marine, Service Hydrographique, included in the “Marine Subserie 4 JJ 7-26: Journaux de bord” were used in this part of the study. The results suggest that although a wide range of terms was in use during the study period, the vast majority of logbook entries fell into a relatively small number of descriptors. The five most commonly used wind force terms accounted for 62 per cent of all French logbook entries. Much of the proliferation of terms resulted from the frequent use of multiple adjectival qualifiers to the principal descriptor, once these had been removed, leaving only the ‘base terms’, the underlying vocabulary was more clearly distinguishable.

Contemporary texts provided much helpful guidance in the interpretation of the terms. The *Diccionario Marítimo Español* (O’Scanlan, 1831), although a Spanish item, contains a useful appendix with French – Spanish translations (see previous Spanish section). Also useful was the *Nuevo Diccionario Francés- Español y Español- Francés* (Salva, 1897) and the *Laroussse de la Langue Française*. Alexander Dalrymple’s late eighteenth century publication *Practical Navigation* also contains a summary table

showing how English and French terms correspond, and is one of the earliest such attempts at direct translation. The latter is of interest as the table is based not only on contemporary logbooks but also on Dalrymple's correspondence with French mariners. Some of the terms cited by Dalrymple, including *vent peu* and *vent moyenne frais* (see Appendix II) did not, however, appear in the sample of logbooks used in this study. Fortunately, a large number of contemporary French and French-English maritime dictionaries have survived, and provided useful evidence for the meaning of different terms. Those by Bourde (1773), Lescallier (1783), Romme (1804, 1813) and Lecomte (1835) were of particular value. That by Pirrie (1895) although post-dating the study period was also useful. Falconer's *Universal Dictionary of the Marine* (1780) provides French translations of many of its terms, but contains also a valuable appendix of French terms and provides another opportunity for comparing contemporary terms in different languages.

In common with the Spanish terms, the analysis of French expressions has revealed a number of ambiguous expressions at the upper end of the wind force scale. Descriptions were encountered that clearly denote winds of notable strength, but it proved impossible to allocate them with confidence to any single point on the Beaufort scale. Such terms are denoted by BF>8 in the dictionary.

There is evidence, particularly from the many contemporary dictionaries, that the French marine vocabulary was undergoing an evolution in parallel with that taking place in English at that time. In particular, the term brisa (*Eng*. breeze), was not in widespread use in 1750, and was very narrowly defined (restricted to coastal land and sea breezes). Within twenty years, however, the term was being employed widely to cover a range of wind strengths at the lower end of the scale, and was applied irrespective of its suspected cause.

DICTIONARY OF FRENCH TERMS

a peu: IU, BF 5

affraîcheur: IU.

affraichi: BF 6

beacoup moins violent: IU, BF > 8

beacoup molli: IU, BF 1

beau: IU, BF 5

beau frais: BF 5

beau petit frais: BF 4

beaucoup de calme: BF 0

beaucoup de forces: BF > 8

beaucoup de vent: BF 7

belle brise: BF 4

bien petit frais: BF 4

bon frais: BF 5

bon frais an peu violent: BF 5

bon frais fraisant: BF 5

bon gros frais: IU, BF 7

bon petit frais: BF 4

bon vent: IU

bonne brise: BF 5

brise carabinée : BF 6

brise fiable : BF 2

brise folle: NDA, literally, baffling wind, and having no specific foce

brise forte: BF 7

brise fraîche : BF 5

brise ronde : NDA, translates as a ‘steady breeze’

calme: BF 0

calme plat: BF 0

calme tout plat: BF 0

considerablement: IU, BF 8

coup de vent: BF 10

en tourmente: BF > 8

extrêmement fort: BF 10

extrêmement violent: BF 11

faible: BF 1

faible brise: BF 1

forcé: BF 8

fort: BF 7

forte: BF 7

fraîcheur: BF 1

fraîchir: BF 6

frais: BF 6

fraisant: IU, NDA

grand frais: BF 7

grand vent: BF 7

grande violence: BF 11

gros: BF 7

gros frais: BF 7

gros vent: BF 9

grosse brise: IU, BF 7

il a calmé: IU, BF 0

impetueux: BF > 8

joli frais: BF 4

joli petit frais: BF 4

jolie brise: BF 4

légère brise: BF 2

maniable : BF 4

mediocre: NDA

molli: IU, BF 2

mou: IU, BF 2

mousson : NDA, translates as the generic term ‘monsoon’. It makes no specific reference to force, and its use is confined to vessels in the asiatic tropics.

ouragan: BF 12

petit: NDA

petit vent: IU, BF 5

petit air: BF 3

petit fraîcheur: BF 4

petit frais: IU, BF 4

petit temps: IU, BF 3

petit vent: BF 3

petite brise: BF 3

peu: IU, BF 5

porter les perroquets : BF 5. Contemporary duictionaries define this as a ‘top sail gale’. See English section.

presque calme: BF 1

rafale (incl. raffalle): NDA, translates as ‘squalls’ (see also English section).

rafraîchi: IU, NDA

rafraîchissant: IU, NDA

soufflant impétueux: IU, BF 8

tempête: BF 10

tiphon (incl. tifon) : BF 12, derived from the Chinese term for ‘great wind’, and restricted to vessels in the asiatic tropics. See also English section.

tombé: IU, BF 0

vent alizé : NDA, translates as ‘Trade Wind’. See also English section.

vent forcé : BF 8

vent frais: BF 6

vent moins impéteux : BF 6, contemporary dictionaries define this as a ‘stiff gale’. See also English section.

vent mou : BF 2

ventand considerablement: BF > 8

violence: BF 11

violent: BF 11

violent ouragans: BF 12

SEA STATE DESCRIPTORS IN LOGBOOKS

Wind force terms followed a general 'code of practice' in all four national groups of logbooks examined here, and since 1906 the Beaufort Wind force scale has been specifically linked to the state of the sea (see Appendix I). Today marine observers are issued with official 'state of the sea cards' with which to compare and determine the nature of the observed conditions (Meteorological Office, 1983). The pictorial association between the two has, however, a much longer history. With notable prescience, Alexander Dalrymple (1789) used what he described as "…pictures of sea-pieces in my possession, to shew the different terms on the Scale, and teach the navigators, of all countries, the same language in describing winds." (p.36). It is perhaps, therefore, all the more remarkable that, with one exception, the description of sea state followed no Beaufort-like convention, indeed it was infrequently recorded in comparison with wind force. The one exception was that of the Spanish logbooks of the *Carrera de Indias*. Here is found a vocabulary unique in its concision and application. Once again, the over-qualification of 'base terms' and the occasional use of peculiar, non-standard descriptions needed to be addressed but, having done so, the following nine-point scheme emerged with notable clarity (see table below). This tradition continued, and as late as the second half of the nineteenth century when another, not altogether dissimilar, scale for Spanish navigators was proposed in 1881: *muy llana, llana, marejadilla, marejada, mar picada, muy picada, mar gruesa, mar gruesa y gruesísima*. It was just twenty five years later that George Simpson suggested the formal link between the Beaufort wind force and sea state that is still used today. The degree to which the eighteenth century Spanish system anticipated that of the twentieth century is remarkable, and for purposes of comparison the Douglas Sea Scale (the system currently in use, and also of nine points) is included in the following table.

Scale point†	Original Spanish term	English translation	Douglas sea scale
0	calma	calm	calm
1	llana	flat	smooth
2	bella	pleasant	slight
3	marejada	swell	-
4	picada	choppy	moderate
5	muy picada	very choppy	rough
6	gruesa	heavy sea	very rough
7	muy gruesa	very heavy sea	high
8	muy alta	high waves	very high
9	furiosa	stormy	precipitous
-	indeterminante	uncertain	confused

† this number system is used only to illustrate the order of the scale. No numbers were used in the original documents.

English officers, so assiduous in their observations of wind force, are notably reticent on the issue of sea state. Such observations as were made were usually confined to the incidence of swell and the direction from which it was driven. Only rarely was the sea state *sensu stricto* noted, and in many cases weeks or months might pass without any such reference. Dutch and French mariners seem likewise to have paid scant formal regard to the sea state.

SUMMARY OF WIND FORCE TERMS IN BEAUFORT SCALE ORDER

BEAUFORT FORCE 0: calm

ENGLISH	SPANISH	FRENCH	DUTCH
calm, flat calm, dead calm,	calma, calma muerte, calmo, debil, no ha habido, pacifico, sereno, sosegado,	beaucoup de calme, calme, calme plat, calme tout plat, il a calme, tombé	blackstill, bladstil, dood stil, doodstil, doodstilletjes, doodstilte, stil, still, stille, stilleties, stilletjes, stillies, stilte, stiltetjes, stilties

BEAUFORT FORCE 1: light airs

ENGLISH	SPANISH	FRENCH	DUTCH
inclinable to calm, light airs, small airs	aventolinado, blandura, ventolinas	beaucoup molli, faible, faible brise, presque calme, fraîcheur	al de zeilen bij, briesie, briesje, frisse koelte, flaauw, flauw, flauwtjes, flouw, flaauwe koelte, flauwe koelte, kleine koelte, lichte koelte, ongestadige flauwe koelte, rondlopende koelte, variable, variabele koelte

BEAUFORT FORCE 2: light breeze

ENGLISH	SPANISH	FRENCH	DUTCH
easy breezes, feint breeze, light breeze, light winds, little winds	abrisado, brisa, brisado, calmoso, de 6 y 7 millas, escaso, flojito, pardo, poco, suave, vacilante,	brise fiable, légère brise, molli, mou vent mou	bovenbramzeilskoelte, coeltie, coeltje, flauwe bovenbramzeilskoelte, gemene frisse bramzeilskoelte, gemene koelte, gestadige bovenbramzeilskoelte, koelte, koelten, koeltie, koeltje, koeltjes, labber, labbere koelte, labberkoelte, labber bramzeilskoelte, leizeilskoelte, lijzeilskoelte, lichte bovenbramzeilskoelte, luchtje, lugie, lugje, lugtje, ongestadige koelte, slappe koelte, zuchje, zuchtje, zuggie, zugje

BEAUFORT FORCE 3: gentle breeze

ENGLISH	SPANISH	FRENCH	DUTCH
easy gale, feint gale, gentle breeze, gentle gale, gentle trade, light gale	de 8 y 9 millas, endeble, flojo	petit air, petit temps, petit vent, petite brise	bramzeilskoelte, flauwe bramzeilskoelte, gemene bramzeilskoelte, gestadige bramzeilskoelte, lichte bramzeilskoelte, ongelijke bramzeilskoelte, ongestadige bramzeilskoelte

BEAUFORT FORCE 4: moderate breeze

ENGLISH	SPANISH	FRENCH	DUTCH
light monsoon, light trade, moderate, moderate breeze, pleasant breeze, pleasant wind, small gale	abonanzado, abonanzando, abonanzo, apacible, apaciguado, benigno, bonancible, bonanza, moderado	beau petit frais, belle brise, bien petit frais, bon petit frais, joli frais, joli petit frais, jolie brise, petit fraîcheur, petit frais maniable	frisse marszeilskoelte, gemene marszeilskoelte, marszeilskoelte, ongestadige marszeilskoelte, stijve bramzeilskoelte, topzeilskoelte

BEAUFORT FORCE 5: fresh breeze

ENGLISH	SPANISH	FRENCH	DUTCH
brisk trade, fine breeze, fine gale, fine trade, fresh breeze, moderate monsoon, moderate trade, pleasant gale, pleasant trade, steady breeze, top-gallant gale	fresquecito, fresquito,	a peu, beau, beau frais, bon frais, bon frais an peu violent, bon frais fraisant, bonne brise, brise fraîche, petit vent, peu, porter les perroquets	bovenmarszeilskoelte, dubbelgereefde bramzeilskoelte, enkelgereefde (marszeils)koelte, gereefde marszeilskoelte, gestadige koelte, ongestadige gereefde marszeilskoelte, passaat, passaatkoelte, passaatwind, stijve marszeilskoelte

BEAUFORT FORCE 6: strong breeze

ENGLISH	SPANISH	FRENCH	DUTCH
blows fresh, brisk gale, fresh trade, fresh wind, steady gale, steady trade, stiff breeze, strong breeze	de alta vela, de toda vela, de toda vela larga, durito, fresco, frescote, fuertecito, vivito	affraichi, brise carabinée, fraîchir, frais, vent frais, vent moins impéteux	dubbelgereefde marszeilskoelte, stijve gereefde marszeilskoelte, stijve koelte

BEAUFORT FORCE 7: near gale

ENGLISH	SPANISH	FRENCH	DUTCH
moderate gale, strong monsoon, strong trade	altivo, duro, frescachon, frescachonazo, fuerte, intenso, mucho, recio, vivo	beaucoup de vent, bon gros frais, brise fort, fort, forte, grand frais, grand vent, gros, gros frais, grosse brise	harde wind

BEAUFORT FORCE 8: gale

ENGLISH	SPANISH	FRENCH	DUTCH
fresh gale, strong wind	muchisimo, temporal	considerablement, force, soufflant impétueux, vent forcé	onderzeilskoelte

BEAUFORT FORCE 9: strong gale

*refers to those expression that can only be classified as force 9 or greater

ENGLISH	SPANISH	FRENCH	DUTCH
blows strong, heavy gale, strong gale, violent gale	alterados*, amenazante*, atrubonado*, borrascoso*, demasiado*, fuerza*, furia*, furioso*, impetuoso*, inaguantable*, insoportable*, insufrible*, intolerable*, rieguroso*, tempestad*, tempestuoso*, tormenta, tormentoso, turbonada*	beacoup moins violent*, beaucoup de forces*, en tourmente*, gros vent, impétueux*, ventand considerablement*	dicht gereefde marszeilskoelte, gereefde onderzeilskoelte

BEAUFORT FORCE 10: storm

ENGLISH	SPANISH	FRENCH	DUTCH
blows hard, hard gale, whole gale		coup de vent, extrêmement fort, tempête	dicht gereefde onderzeilskoelte, storm, swaere storm, zware storm

BEAUFORT FORCE 11: violent storm

ENGLISH	SPANISH	FRENCH	DUTCH
storm, tremendous gale, violent storm	fortisimo	extremêment violent, grande violence, violent, violence	zeer zware storm

BEAUFORT FORCE 12: hurricane

ENGLISH	SPANISH	FRENCH	DUTCH
hurricane, typhoon	ahuracanado, ferocidad extraordinario, fugadas huracanadas, huracan, huracanado, tormentoso como especie de huracan	ouragan, tifon, violent ouragan	orcaan, orcaen, orkaan

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APPENDIX I

THE BEAUFORT WIND FORCE AND WEATHER SCALES

There have been several versions of the Beaufort Scale. Francis Beaufort first proposed his scheme in 1806 when, on 13th January, he entered the following comments and notes in the logbook of the vessel of which he was then Captain, HMS *Woolwich*.[3] This scale employed no new terms and, indeed, was itself not wholly original and is a close copy of the scale proposed by Alexander Dalrymple (hydrographer to the English East India Company) in the late eighteenth century (see Appendix II).

"Hereafter I shall estimate the force of the wind according to the following scale as nothing can convey a more uncertain idea of wind and weather than the old expression of moderate and cloudy &c &c"

0	Calm	7	Gentle steady gale
1	Faint air just not calm	8	Moderate gale
2	Light airs	9	Brisk gale
3	Light breeze	10	Fresh gale
4	Gentle breeze	11	Hard gale
5	Moderate breeze	12	Hard gale with heavy gusts
6	Fresh breezes	13	Storm

Within eighteen months, Beaufort modified his scale and included, for the first time, a set of criteria. In his logbook for 14th September 1807, the following appears:

Scale of Winds

Or key to the wind column in this log

1	Light airs	That which just enables a ship to steer
2	Light breeze	That which will impel a man of war with all sail set by the wind 3 or 4 knots
3	Gentle breeze	That which will impel a man of war with all sail set by the wind 4 or 5 knots
4	Moderate breeze	That which will impel a man of war with all sail set by the wind 5 or 6 knots
5	Fresh breeze	That with which whole topsails, royals, staysails &c may be just carried full and by
6	Stiff breeze	That with which single reefed topsails, gallants, courses, jib and driver would be just carried by the wind, by a wholesome frigate when fairly pressed in chase
7	Moderate gale	That which the same vessel would just set 2nd reefed topsail and jib
8	Fresh gale	That which the same vessel could barely carry 3rd reefed topsails and courses
9	Strong gale	That which she would beat off a lee shore with reefed courses
10	A whole gale	That when she could show no other courses than storm staysails
11	Storm	That which would blow away any sails made in the usual way
12	Hurricane	Hurricane!

Beaufort continued to use this scheme and various development of it in all his logbooks, ruling additional columns into which the wind force number could be entered. The scale was finally adopted in December 1838 by the Admiralty for use in all Royal Navy logbooks, but even that had to be modified as ship design and the introduction of steam power imposed new demands on the scheme. The most recent form, together with the equivalent sea states, is given below, and is that to which the definitions in this volume are related.

[3] This logbook is in the care of the UK Meteorological Office Archives.

Force	term	Description of the state of the sea	Wind speed (knots)	range	Sea state	Wave height (m)
0	Calm	Sea like a mirror	0	<1	Calm	0
1	Light air	Ripples with the appearance of scales are formed, but without foam crests.	2	1-3	Smooth	0.1
2	Light breeze	Small wavelets, still short but more pronounced. Crests have a glassy appearance and do not break.	5	4-6	Smooth	0.2
3	Gentle breeze	Large wavelets. Crests begin to break. Foam of glassy appearance. Scattered white horses.	9	7-10	Slight	0.6
4	Moderate breeze	Small waves, becoming longer, fairly frequent white horses.	13	11-16	Moderate	1
5	Fresh breeze	Moderate waves, taking a more pronounced long form; many white horses are formed. Chance of some spray.	19	17-21	Rough	2
6	Strong breeze	Large waves begin to form; white foam crests are more extensive everywhere. Probably some spray.	24	22-27	Very rough	3
7	Near gale	Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of the wind.	30	28-33	High	4
8	Gale	Moderately high waves of greater length; edges of crests begin to break into spindrift. The foam is blown in well-marked streaks along the direction of the wind.	37	34-40	Very high	5.5
9	Strong gale	High waves. Dense streaks of foam along the direction of the wind. Crests of waves begin to topple, tumble and roll over. Spray may affect visibility.	44	41-47	Very high	7
10	Storm	Very high waves with long over-hanging crests. The resulting foam, in great patches, is blown in dense white streaks along the direction of wind. On the whole the surface of the sea takes a white appearance. The 'tumbling' of the sea becomes heavy and shock-like. Visibility is affected	52	48-55	Phenomenal	9
11	Violent storm	Exceptionally high waves (small & medium sized ships might be lost to view for a time behind the waves). The sea is completely covered with long white patches of foam lying along the direction of the wind. Every-where the edges of the wave crests are blown into froth. Visibility is affected.	60	56-63	Phenomenal	11.5
12	Hurricane	The air is filled with foam and spray. Sea completely white with driving spray; visibility very seriously affected	64+			14

APPENDIX II

ALEXANDER DALRYMPLE'S WIND FORCE SCALE

The following table is a direct and unabridged copy from Alexander Dalrymple's *Practical Navigation* of 1789. It includes his own 'wind scale', which is of particular importance as it predates Francis Beaufort's scheme of 1806, and upon which the latter in heavily drawn. Indeed, the two were very much acquainted. Dalrymple acknowledges, in turn, the engineer John Smeaton's scale based on the study of the behaviour of a wind mill in Lincolnshire, eastern England (Smeaton, 1759). Of particular interest is Dalrymple's inclusion of a scale of comparative French terms in use at the time. For a fuller discussion of the origin of Beaufort's Scale and its development from earlier schemes see Wheeler and Wilkinson (in press).

TABLE OF COMPARISON OF WINDS, from Ship's Journals, with Mr. SMEATON'S Scale from Authorpe Mill, the Length of the Sails being 34 feet from the Center; or 68 feet diameter.

My Scale	Mr. Smeaton's Scale	and his description	French Terms
0 Calm	0 Calm	The Motion of the Air, not felt	0 Calme
1 Faint-Air, i.e. not quite calm	Scarce a Breeze	Do…….scarcely felt	1 Petit fraicheur, ou feible
2 Light-Air	Light Breeze not working	The direction of the wind sensible, but insufficient to move the Mill, or under 6 turns a minute	2 Fraicheur
3 Light -Breeze	1 Light working Breeze	Just sufficient to move the Mill 6 turns	3 Petit frais, ou petit brise
4 Gentle-Breeze	2 Breeze	Sufficient, to move the branches of trees, and Mill from 6 to 9 turns	4 Jolie brise?
5 Fresh-Breeze	3 Fresh Breeze	Move the boughs with some noise, Mill 9 to 13 turns	5 Jolie frais?
6 Gentle-Gale			6 Vent peu de frais
7 Moderate-Gale			7 Vent moyenne frais
8 Brisk-Gale	4 Fresh	Wind heard against solid objects and agitation of trees, Mill from 13 to 18	8 Vent frais
9 Fresh-Gale	5 Very fresh	Wind growing noisy, and considerable agitation of trees, Mill 18 to ¾ cloth	9 Bon frais
10 Strong-Gale	6 Hard	Wind troublesome, larger trees bend, ¾ to ¼ cloth	10 Grand frais
11 Hard-Gale	7 Very hard	Wind very loud and troublesome, large trees much agitated, Mill ¼ cloth to close struck	11 Vent fort
12 Storm	8 Storm	Wind exceeding loud, trees very much agitated and some broke, mill 25 to 30 turns without cloth	12 Tempeste

APPENDIX III

TRANSLATIONS OF PRESENT DAY BEAUFORT WIND FORCE TERMS

BF	ENGLISH	ESPAÑOL	FRANÇAIS	DUTCH
0	Calm	Calma	Calme	Stil
1	Light airs	Ventolina	Trés légère brise	Zwakke wind
2	Light breeze	Flojito	Légère brise	Zwakke wind
3	Gentle breeze	Flojo	Petite brise	Matige wind
4	Moderate breeze	Bonancible	Jolie brise	Matige wind
5	Fresh breeze	Fresquito	Bonne brise	Vrij krachtige wind
6	Strong breeze	Fresco	Vent frais	Krachtige wind
7	Near gale	Frescachón	Grand frais	Harde wind
8	Gale	Temporal	Coup de vent	Stormachtig
9	Strong gale	Temporal fuerte	Fort coup de vent	Storm
10	Storm	Temporal duro	Tempête	Zware storm
11	Violent storm	Temporal muy duro	Violent tempête	Zeer zware storm
12	Hurricane	Temporal huracanado	Ouragan	Orkaan

APPENDIX IV

SAIL PLAN AND SAIL NAMES OF A TYPICAL OCEAN-GOING VESSEL OF THE LATE EIGHTEENTH AND EARLY NINETEENTH CENTURIES

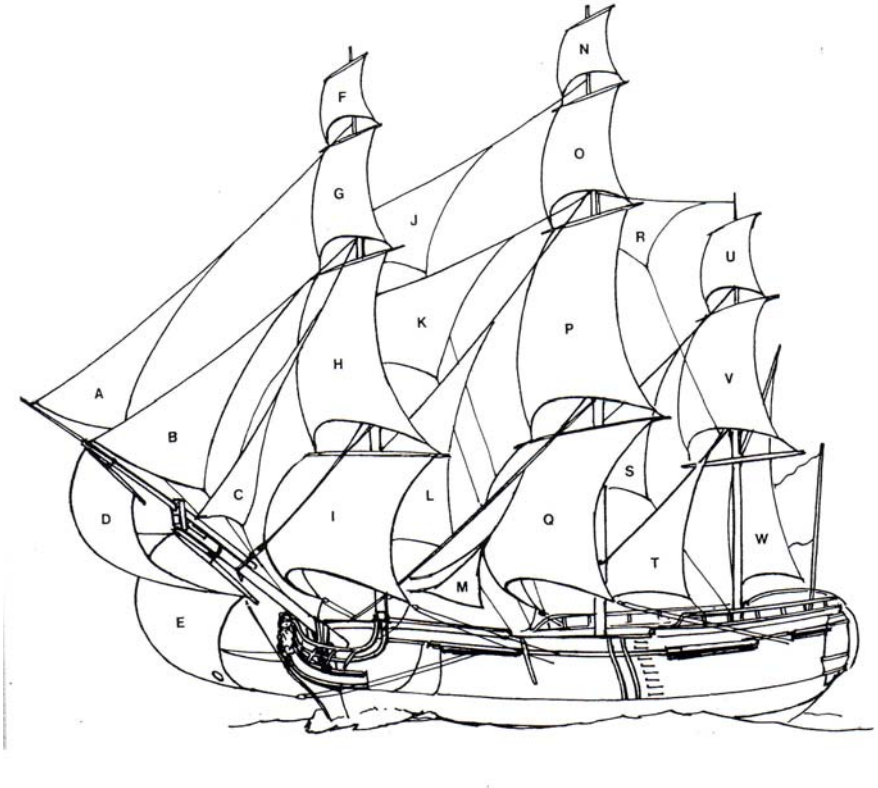

Figure 1. Sail plan of a typical late eighteenth century ship-of-the-line. Most of the logbooks used in the CLIWOC project would have been built to this, or a very similar, design. The key to the sail plan is provided in the following table in which the names of the various sails are given in each of the four languages used in the project.

drawing by Mark Myers RSMA, F/ASMA from Harland and Myers*, Seamanship in the Age of Sail,* (1984). Reproduced by kind permission of the authors.

KEY TO FIGURE 1

key letter	English description	Dutch description	French description	Spanish description
A	Flying jib	Buitenkluiver	Grand foc	Foque volante
B	Jib	Kluiver	Faux foc	Foque
C	Fore topmast staysail	Voorstengen-stagzeil	Petit foc	Contrafoque
D	Spritsail topsail	Bovenblinde	Contre-civadière	Sobrecebadera
E	Spritsail	Blinde	Civadière	Cebedera
F	Fore royal sail	Voorboven-bramzeil	Petit cacatois	Sobrejuanete
G	Fore topgallant sail	Voorbramzeil	Petit perroquet	Vela de juanete
H	Fore topsail	Voormarszeil	Petit hunier	Vela de velacho
I	Fore course or fore sail	Fok	Voile de mizaine	Vela de trinquete
J	Main topgallant staysail	Grootboven-bramstagzeil	Voile d'étai de grand perroquet	Vela de juanete mayor
K	Middle staysail	Grootbramstagzeil	Voile d'étai de de chouque	Estay mayor
L	Main topmast staysail	Grootstengen-stagzeil	Voile d'étai de hune	Vela de estay y gavia
M	Main staysail	Grootstagzeil	Grand voile d'étai de avant	Vela de estay mayor
N	Main royal	Grootboven-bramzeil	Grand cacatois	Sobrejuanete mayor
O	Main topgallant sail	Grootbramzeil	Grand perroquet	Vela penguito
P	Main topsail	Grootmarszeil	Grand hunter	Gavia
Q	Main course or mainsail	Grootzeil	Grand voile	Vela mayor
R	Mizzen topgallant staysail	Kruisbramvlieger	Voile d'étai de perruche	Vela penguito
S	Mizzen topmast staysail	Kruisstengenstagzeil	Diablotin	Vela de estay de mastelero de mesana
T	Mizzen staysail	Kruisstagzeil	Focd'artimon	Vela de estay de mesana
U	Mizzen topgallant sail	Kruisbramzeil	Perruche	Juanete de sobremesana
V	Mizzen topsail	Kruismarszeil	Perroquet de fougue	Sobremesana
W	Mizzen sail	Bezaan	Ourse d'artimon	Cangreja